CLAIMS

What is claimed is:

1. An optical pickup unit feeding apparatus for moving an optical pickup unit by rotation of a lead screw with a spiral groove in an optical disc drive, comprising:

a guide member combined with the optical pickup unit, the guide member comprising:

one or more contact parts engaging the spiral groove formed on the lead screw, and applying a force to the optical pickup unit in response to the rotation of the lead screw, wherein the force moves the optical pickup unit; and

an elastic member comprising a first elastic section elastically engaging the contact parts to the spiral groove, and a second elastic section forcing the contact parts not to separate from the spiral groove,

wherein a spring constant of the second elastic section is greater than a spring constant of the first elastic section.

2. The optical pickup unit feeding apparatus of claim 1, wherein the elastic member comprises:

a body forming the second elastic section; and

at least one protrusion from the body forming the first elastic section.

3. The optical pickup unit feeding apparatus of claim 2, wherein the elastic member is a viscoelastic material having a damping characteristic.

4. The optical pickup unit feeding apparatus of claim 1, wherein the elastic member further comprises a third elastic section;

wherein an elastic force is reduced when a displacement of the elastic member in the second elastic section separates the contact parts from the spiral groove.

5. The optical pickup unit feeding apparatus of claim 4, wherein the elastic member comprises:

a body forming the second elastic section;

at least one protrusion from the body forming the first elastic section; and

at least one cavity in the body forming the third elastic section.

6. The optical pickup unit feeding apparatus of claim 5, wherein the elastic member is a viscoelastic material having a damping characteristic.

7. The optical pickup unit feeding apparatus of claim 1, wherein the elastic member is a coil spring, wherein the first and second elastic sections have different diameters, and a spring constant of the coil spring is inversely proportional to the diameter thereof.

8. The optical pickup unit feeding apparatus of claim 7, wherein a diameter of the first elastic section is greater than a diameter of the second elastic section.

9. An optical pickup unit feeding apparatus for moving an optical pickup unit by rotation of a lead screw with a spiral groove, comprising:

a guide member combined with the optical pickup unit, the guide member comprising:

one or more contact parts engaging the spiral groove formed on the lead screw, applying a force to the optical pickup unit in response to the rotation of the lead screw, wherein the force moves the optical pickup unit; and

an elastic member pushing the contact parts toward the spiral groove,

wherein the elastic member is a viscoelastic material having a good damping characteristic.

10. An optical disc drive comprising:

an optical pickup unit accessing a rotating optical disc; and

an optical pickup unit feeding apparatus moving the optical pickup unit in a radial direction of the optical disc by rotation of a lead screw with a spiral groove,

wherein the optical pickup unit feeding apparatus comprises:

a guide member combined with an optical pickup unit, the guide member comprising:

one or more contact parts engaging the spiral groove formed on the lead screw, applying a force to the optical pickup unit in response to the rotation of the lead screw, wherein the force moves the optical pickup unit; and

an elastic member comprising a first elastic section elastically engaging the contact parts the spiral groove, and a second elastic section forcing the contact parts not to separate from the spiral groove,

wherein a spring constant of the second elastic section is greater than a spring constant of the first elastic section.

11. The optical disc drive of claim 10, wherein the elastic member comprises:

a body forming the second elastic section; and

at least one protrusion from the body forming the first elastic section.

12. The optical disc drive of claim 11, wherein the elastic member is a viscoelastic material having a good damping characteristic.

13. The optical disc drive of claim 10, wherein the elastic member further comprises a third elastic section;

wherein an elastic force is reduced when a displacement of the elastic member in the second elastic section separates the contact parts from the spiral groove.

14. The optical disc drive of claim 13, wherein the elastic member comprises:

a body forming the second elastic section;

at least one protrusion from the body forming the first elastic section; and

at least one cavity in the body forming the third elastic section.

15. The optical disc drive of claim 14, wherein the elastic member is a viscoelastic material having a good damping characteristic.

16. An optical disc drive comprising:

an optical pickup unit accessing a rotating optical disc; and

an optical pickup unit feeding apparatus moving the optical pickup unit in a radial direction of the optical disc by rotation of a lead screw with a spiral groove,

wherein the optical pickup unit feeding apparatus comprises:

a guide member combined with the optical pickup unit, the guide member comprising:

one or more contact parts engaging the spiral groove formed on the lead screw, applying a force to the optical pickup unit in response to the rotation of the lead screw, wherein the force moves the optical pickup unit; and

an elastic member pushing the contact parts toward the spiral groove,

wherein the elastic member is made of a viscoelastic material having a good damping characteristic.

17. A method of moving an optical pickup unit by rotation of a cylindrical member with a groove in an optical disc drive, the method comprising:

providing elastic force on one or more contact parts engaged with the groove formed on the cylindrical member; and

rotating the cylindrical member in opposite directions;

wherein the elastic force is provided by an elastic member comprising a first section and a second section, and a spring constant of the second elastic section is greater than a spring constant of the first elastic section.

18. The method of claim 17, wherein the first elastic section elastically engages the contact parts to the groove, and the second elastic section forces the contact parts not to separate from the groove.